

HIGH EFFICIENCY CHARGE PUMP WITH PREVENTION FROM REVERSE CURRENT

Abstract

First and second clocks are applied to first and second capacitors, respectively. First and second former-stage clocks are applied to first and second former-stage capacitors, respectively. A first switch couples the second former-stage capacitor with the first capacitor. A second switch couples the first former-stage capacitor with the second capacitor. A first reverse current preventing circuit couples a control electrode of the first switch alternately with the second capacitor and the second former-stage capacitor. A second reverse current preventing circuit couples a control electrode of the second switch alternately with the first capacitor and the first former-stage capacitor. Falling edges of the first and second clocks occur earlier than falling edges of the first and second former-stage clocks, respectively. Rising edges of the first and second former-stage clocks occur earlier than rising edges of the first and second clocks, respectively.